

**What is claimed:**

1. A method of oxidizing a semiconductor wafer characterized in that steam oxidation is initiated without first stabilizing the wafer in dry oxygen.
2. The method of claim 1, where steam is introduced during heating to initiate steam oxidation and oxidants are employed with the steam.
3. The method of claim 2 where the other oxidants are comprised of any one of, or a mixture of any of: atomic oxygen (O), oxygen gas (O<sub>2</sub>), ozone (O<sub>3</sub>), nitrous oxide (N<sub>2</sub>O) and nitric oxide (NO).
4. The method of claim 1 further comprising the following steps:  
raising the temperature of the wafer in the presence of steam in a process chamber;  
and  
cooling the wafer.
5. The method of claim 1 wherein the steam oxidation is carried out at a temperature in the range of about 500°C to 1300°C.
6. The method of claim 4 wherein the temperature is raised at a ramp rate in the range of about 10°C/sec to 300°C/sec.
7. A method of oxidizing the surface of a semiconductor wafer in a process chamber, comprising the steps of:  
ramping the temperature of the wafer to an oxidizing temperature while conveying steam to the wafer, wherein the oxidizing temperature is in the range of about 500°C to 1300°C.
8. The method of claim 7 wherein the method is carried out in a single wafer chamber.
9. The method of claim 7 wherein the method is carried out in a rapid thermal processing (RTP) chamber.
10. The method of claim 7 further comprising oxidizing the surface of the semiconductor wafer to form a dielectric layer thereon.